

## The Semantic Effects of non-A' Traces: Evidence from Ellipsis Parallelism

Jeremy Hartman (MIT)

A central puzzle of the syntax/semantics interface is the interpretation of movement. A-bar movement has self-evident semantic consequences, but the status of A-mvt and head-mvt is less obvious. This paper presents evidence from ellipsis that all three types of movement have effects on semantics and are therefore relevant to the architecture of the grammar as a whole.

**Background** VP-ellipsis is often disallowed when sluicing in the same clause is possible:

- (1) a. John borrowed a book. Guess which book (\*he did).
- b. Mary was trying to kiss someone, but I don't know who (\*she was).
- c. *Speaker A:* John has broken something. *Speaker B:* Really? What (\*has he)?

Takahashi & Fox (2005) (cf. also Merchant 2008) propose a constraint that prefers the largest ellipsis in a given Parallelism Domain (PD) determined by semantic identity to an antecedent:

- (2) *MaxElide:* Elide the biggest deletable constituent reflexively dominated by the PD.

Normally, the PD could be as small as the elided VP itself, and MaxElide would be trivially satisfied. However, the conditions on parallelism prohibit a PD from containing any variables bound from outside the PD ("rebound variables"). In (1), then, the VP cannot be a PD, since it contains such a variable (the trace of the wh-word). This trace forces the PD to be large enough to contain its binder. MaxElide applies to this larger PD, and the biggest deletable constituent is the constituent targeted in sluicing. Deletion of VP thus violates MaxElide.

**Wh-Adverbials** I examine the behavior of wh-adverbials, and show that they do not trigger MaxElide violations with VP ellipsis (3), because they can originate above the elided VP. They can be adjoined VP-externally and thus need not leave a trace inside the VP (4).

- (3) a. Mary was trying to kiss someone, but I have no idea why (she was).
- b. *Speaker A:* John's leaving. *Speaker B:* Do you know when (he is)?
- c. John knows the prisoners escaped, but he doesn't know how (they did).
- (4) I don't know [<sub>CP</sub> when [<sub>TP</sub> ~~when~~ [<sub>TP</sub> John will [<sub>VP</sub> leave]]]].

This explanation makes a straightforward prediction: In a structure where the wh-adverbial originates *below* the elided VP, VP-ellipsis should be ruled out by MaxElide. I show that this prediction is borne out by examining the construal of wh-adverbials when the elided constituent includes an embedded clause. The sluicing cases allow both matrix and embedded construal of the wh-adverbial, while the VP-ellipsis cases allow only matrix construal.

- (5) a. John wanted Mary to perform, but I don't know when.                   ✓Matrix ✓Emb.
- b. John wanted Mary to perform, but I don't know when he did.       ✓Matrix \*Emb.
- (6) a. John told Mary to dance, and you'll never guess how.               ✓Matrix ✓Emb.
- b. John told Mary to dance, and you'll never guess how he did       ✓Matrix \*Emb.

The same effect is found with 'high' (TP-adjoined) vs 'low' (VP-internal) readings of certain adverbials (Iatridou et al. 2002). Sluicing has both readings; VP-ellipsis, only the high one (8)

- (7) John has been in Boston for two months.
  - a. John is in Boston now, and has been there for the past two months. (HIGH)
  - b. There was a two-month period that John spent in Boston. (LOW)
- (8) a. John's been in Boston, but I don't know for how long.               ✓High ✓Low
- b. John's been in Boston, but I don't know for how long he has.     ✓High \*Low

Similar effects obtain with wh-subjects, which have been observed (Merchant 2008) not to trigger MaxElide violations in the simplest cases (9). I show that they *do* in fact trigger MaxElide violations when extracted from an embedded clause (10):

- (9) a. Someone's laughing, but I don't know who (is).
- b. *Speaker A:* Someone left. *Speaker B:* Who (did)?
- (10) a. John wants someone to leave, but I don't know who (\*he does).
- b. John said a certain girl would come, but I forget which girl (\*he did).

**Non-A-bar Traces** Next, I present and explain a revealing contrast that is only visible in the behavior of wh-adverbials. Example (3) showed that wh-adverbials do not trigger MaxElide violations in embedded questions. In main questions, though, MaxElide violations resurface.

## The Semantic Effects of non-A' Traces: Evidence from Ellipsis Parallelism

Jeremy Hartman (MIT)

- (11) a. *Speaker A*: Mary left already. *Speaker B*: Really? When (\*did she)?  
 b. *Speaker A*: I will fix the car. *Speaker B*: How (\*will you)?  
 c. *Speaker A*: John is leaving the party early. *Speaker B*: Why (\*is he)?

The full MaxElide paradigm to be explained, then, is shown in the table below. (“√” = VP-ellipsis possible, no MaxElide violation; “X” = VP-ellipsis impossible; MaxElide violation.)

	Embedded Questions	Main Questions
<b>Wh- Objects</b>	X (1a,b)	X (1c)
<b>Wh- Adverbials</b>	√ (3)	X (11)
<b>Wh- Subjects</b>	√ (9a)	√ (9b)

Note that only in extraction of wh-adverbials is there an observable asymmetry: VP-ellipsis triggers a MaxElide violation in main but not embedded questions.

To account for this paradigm, I propose that *all traces—A'-traces, A-traces, and traces of head movement—count towards the calculation of the PD*. The trace of T-to-C mvt is a variable that forces a PD big enough to include its binder. The same is true of traces of A-mvt (including, crucially, movement from VP-internal subject position). Let's see how this works:

The semantics for the six cases above are given in (12). The bold, underlined portion of the representation is the (smallest) PD. (Note that although VP-ellipsis relies on a PD small enough that VP is its largest deletable constituent, selection of a larger PD is always possible; this is why sluicing is acceptable in all the cases. Note also that in (f) I assume—following Pesetsky and Torrego (2001), among others—that extraction of wh-subjects in main clauses does not trigger T-to-C movement; this is evidenced by the lack of *do*-support.)

- (12) a. [<sub>CP</sub> what **λx. [TP she λy. will [VP y eat x]]**] (Obj. Emb.)  
 b. [<sub>CP</sub> What **λx. will λz. [TP she λy. z [VP y eat x]]**] (Obj. Main)  
 c. [<sub>CP</sub> how λx. [TP x [TP she **λy. will [VP y leave]]**] (Adv. Emb.)  
 d. [<sub>CP</sub> How **λx. will λz. [TP x [TP she λy. z [VP y leave]]**] (Adv. Main)  
 e. [<sub>CP</sub> who λx. [TP x **λy. will [VP y leave]]**] (Subj. Emb.)  
 f. [<sub>CP</sub> Who λx. [TP x **λy. will [VP y leave]]**] (Subj. Main)

In (a) and (b), the smallest PD containing no rebound variables is the constituent immediately dominating λx. MaxElide applies to this PD, and chooses the largest deletable constituent, which is the sluiced constituent. Ellipsis of a smaller constituent violates MaxElide, so VP-ellipsis is ungrammatical. In (c), the smallest PD with no rebound variables is the constituent immediately dominating λy. MaxElide can apply to this PD, and the largest deletable constituent will be VP, so VP-ellipsis is grammatical. In (d) the smallest PD containing no rebound variables is the constituent immediately dominating λx. MaxElide applies to this PD, and the largest deletable constituent is the sluiced constituent. Ellipsis of a smaller constituent violates MaxElide, so VP-ellipsis is ungrammatical. In (e) and (f), the smallest PD containing no rebound variables is the constituent immediately dominating λy. MaxElide can apply to this PD, and the largest deletable constituent is VP, so VP-ellipsis is grammatical.

Finally, I present evidence from Indian Vernacular English (IVE) (Bhatt 2000) that further implicates the trace of T-to-C movement in the contrast between (c) and (d). IVE has T-to-C mvt in embedded but not main questions, and the contrast is mirrored accordingly. VP-ellipsis with wh-adverbials triggers MaxElide violations in embedded but not main questions. I end by discussing some implications of the claims that both A-movement and head-movement involve variable-binding at level of semantic representation where ellipsis parallelism is calculated. **References** Bhatt, R. 2000. Optimal Expressions in Indian English. *English Language and Linguistics* 4:69-95. Merchant, J. 2008. Variable island repair under ellipsis. In K. Johnson (ed.), *Topics in ellipsis*, 132-153. CUP: Cambridge. Takahashi, S. and D. Fox. 2005. MaxElide and the Re-binding Problem, in E. Georgala & J. Howell (eds) *Proceedings of SALT 15*, Ithaca, NY. CLC Publications.